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AUTHOR Sarapin, Marvin I.
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ABSTRACT

Over the past several decades, there has been considerable concern for improving industrial arts education. The process of program and curriculum improvement involves not only the improvement of instructional content, but also the improved utilization of available information concerning the growth conditions of the learners a program is intended to serve. The concept of developmental tasks can provide the curriculum developer and educational practitioner a useful tool to help identify what students are internally attempting to accomplish at their specific stage of development. A number of states have adopted new guidelines for industrial arts curriculum revision and improvement. The "Maryland Industrial Arts State Guide" identified four stages of development associated with the majority of the state's industrial arts programs. During the 1977-78 school year and summer, several local education agencies in Maryland conducted county-wide curriculum development workshops for industrial arts teachers to apply the foundation presented in the Maryland "Guide." Using a five-step process, the teachers were able to develop and revise instructional programs according to the growth and development of the students. (JH)

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IMPLICATION OF DEVELOPMENTAL TASKS
AND INSTRUCTIONAL CONTENT
IN CURRICULUM DEVELOPMENT

Presenter: Marvin I. Sarapin
Purdue University
School of Technology
Department of Industrial Education

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American Industrial Arts Association

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Introduction

Over the past several decades, there has been considerable concern for improving industrial arts education. Individually and collectively, we have re-examined the definition of our field, the goals and objectives of our programs, and our relationship with other areas of instruction within the school environment.

A significant number of the curriculum development ventures undertaken during this period focused on updating and expanding the content and method of industrial arts instruction. As a result of these efforts to improve and expand the content base of industrial arts, programs derived from the broad technological areas of Production, Materials and Processes, Industrial Communication, and Power and Energy have emerged. Examination of teacher education institution course titles and selected state and local industrial arts curriculum guidelines indicates a gradual (almost evolutionary) diffusion of the program improvement process.

However, there has been concern expressed in our field that program improvement efforts have focused too narrowly on expanding the content base of instruction, while neglecting other factors important to the curriculum development process. In an Academy of Fellows Monograph entitled, "Model of a Theoretical Base of Industrial Arts", Kenneth Brown (1977) stated:

In spite of its continuing to receive endorsement from certain quarters, the age-old notion that successful teaching depends largely, if not entirely, upon knowing well a certain body of subject matter has proven to be a gross misrepresentation of the process of teaching . . . Teaching is a much more involved process and requires a more far-reaching purpose than simply understanding and dispensing a body of subject matter. (p. 16)

Brown's suggestions to individuals concerned with improving industrial arts instruction are contingent upon "placing the learner, instead of subject matter, at the center of the learning process." In expressing his views of program development based upon a doctrine of education as growth, Brown added:

Growth conditions of the learner at each level of development can be honored in educational planning and in the teaching operation. Full knowledge and respect of these conditions should be a mainstay of industrial arts, ranging from program development through course of study construction, classroom operation, and student evaluation. (p. 17)

In an American Industrial Arts Association presentation entitled, "Student Development--An Essential Base for Program Development", Donald Maley (1975) expressed his concerns related to the "content base" emphasis of the instructional programs resulting from the curriculum improvement effort of the 1960's. Maley observed:

A second matter of much lesser concern (to content development) in the programs, and in some instances completely ignored, was that dealing with the societal requirements related to the personal functioning of the individuals in the society, present and future.

However, there is a third category of program development that for the most part was ignored or in which the profession pleaded innocence. This specific area relates to the developmental tasks of the boys and girls whom all industrial arts programs are intended to serve. (p. 239)

Upon inspection of the preceding quotations, one can identify a common theme: The process of program and curriculum improvement involves not only the improvement of instructional content, but also involves the improved utilization of available information concerning the growth conditions of the learners a program is intended to serve. Literature associated with the study of human growth and development is available to assist the curriculum developer in focusing on the developmental tasks of youngsters.

Developmental Tasks

In the 1950 Yearbook of the Association for Supervision and Curriculum Development, Tryon and Lilienthal offered the following explanation of the concept of developmental tasks:

There are certain guideposts which are helpful in gaining an overall picture of growth and development. These guideposts we call "developmental tasks." The concept of developmental tasks provides a framework within which we can organize our knowledge about human behavior and learn to apply this information in dealing with children in our schools

As an individual proceeds from birth to death, there are certain "tasks"--certain learnings, adjustments--which . . . must be mastered if (the individual) is to make normal progress. Developmental tasks are those major common tasks that face all individuals within a given society or sub-group of society. (p. 77)

A further explanation of the concept of developmental tasks was given by Havighurst (1952):

A developmental task is a task which arises at or about a certain period in the life of the individual, successful achievement of which leads to (the individual's) happiness and to success with later tasks, while failure leads to unhappiness in the individual, disapproval by the society, and difficulty with later tasks. (p. 2)

According to Havighurst, there are two reasons why educators should be knowledgeable of the developmental task concept. The first reason was predicated upon a perception that education is a vehicle to assist the individual achieve certain of his/her developmental tasks. The second reason concerned the timing of the instructional process. Havighurst stated:

When the body is ripe, and society requires, and the self is ready to achieve a certain task, the teachable moment has come. Efforts at teaching which would have been largely wasted if they had come earlier, give gratifying results when they come at the teachable moment, when the task should be learned. (p. 5)

Hierarchical listings of specific tasks related to the physiological, sociological, and psychological development of learners have been compiled to assist the educator in utilizing the knowledge of developmental tasks. Tryon and Lilienthal (1950) keyed on physiological changes of the human organism to identify the five general stages of development presented in Table 1.

Tryon and Lilienthal listed a series of specific behaviors associated with each of the five stages of development including infancy, early childhood, late childhood, early adolescence, and late adolescence. For further information concerning these specific developmental tasks, the middle school educator should primarily focus on student behaviors associated with late childhood and the secondary educator with those of early adolescence. However, the educator should have a working knowledge of the entire spectrum of developmental tasks since (1) the maturity level of individual students at a specific grade level will vary; (2) the individual learners will be at different stages of development for specific tasks; and (3) student success or failure of a particular task will be related to prior and subsequent learning experiences.

The concept of developmental tasks can provide the curriculum developer and educational practitioner a useful tool to help identify what students are internally attempting to accomplish at their specific stage of development. Knowledge of this phenomenon can assist us in placing the learner at the center of the instructional process. Developmental tasks can supply the educator with clues needed to select and structure learning activities designed to accomplish the goals and objectives of an instructional program while considering

FIVE DEVELOPMENTAL STAGES FOR YOUTH¹

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DEVELOPMENTAL STAGE	PHYSIOLOGICAL CHANGES	DEVELOPMENTAL STAGES
<u>Infancy</u> Birth to the age of 2 or 3	Characterized by very rapid, but declining, rate of growth, together with instability of physiological processes	This stage brings the child from complete helplessness to partial independence. The child learns to move about, to assert himself as a self, to communicate some of his needs and desires to other people.
<u>Early Childhood</u> 2-3 to 5-6-7 years of age	A period when rate of growth and physiological processes are both becoming stabilized	The child becomes, to a marked degree, adult oriented. He explores adult roles in fantasy play, identifies with adults, and does not question adult authority. He plays with, but does not identify with, other children.
<u>Late Childhood</u> 5-6-7 to the beginning of the physical changes of pubescence--8-13 for girls, 10-15 for boys	Marked by stability in growth rate and stability of physiological processes	The child begins to recognize the fallibility of adults. He begins to identify with other children of his own sex, to see himself as a child, and to see adults as adults. He moves over to a peer-oriented society.
<u>Early Adolescence</u> Beginning of pubescence to puberty	A period of rapidly increasing growth rate and increasing glandular activity which culminates in sexual maturity	The child begins a strong rebellion against adults. He identifies strongly with his peers in a new heterosexual grouping and identifies almost negatively with adults. For him, there is nothing worse than trying to be an adult.
<u>Late Adolescence</u> 15 to 23--puberty to early maturity	Characterized by a declining growth rate and the end of growth, and by stable (adult) body functions	The boy or girl now turns around more or less completely and tries to be an adult. He has a strong desire for people to treat him like an adult.

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¹Adapted from Tiyon and Lilienthal (1950), Chapter 6

the behavioral development of students. In summarizing the usefulness of developmental tasks in the curriculum development and instructional processes, Maley (1975) added:

1. The science of human growth and development has established the validity of "developmental tasks" as a phenomenon associated with the normal growth of all individuals.
2. Developmental tasks should be used as a fundamental base for program or curriculum development.
3. It is possible to structure activities which would contribute to the individual's accomplishing of various tasks.
4. It is possible to integrate the structured activities into the program design so that the student may pursue his/her developmental tasks while accomplishing the goals and objectives of the content and societal elements of the program.
(p. 239)

State-Level Application

Over the past several years, a number of states have adopted new guidelines for industrial arts curriculum revision and improvement. Curriculum guides and other materials have been developed to assist industrial arts educators to identify local instructional needs, formulate teaching methodology and content, evaluate school facilities, and address other variables important to the process of program improvement. The recently developed Maryland Industrial Arts State Guide identified four stages of development associated with the majority of the state's industrial arts programs (middle school and senior high school). For each stage of development (early childhood, late childhood, early adolescence, and late adolescence), developmental tasks similar to those identified by Tryon and Lilienthal were listed. For example, the tasks listed for early adolescence were:

1. Decision-making and reasoning
2. Controlling and using a new body
3. Establishing independence from adults
4. Behaving according to shifting peer codes
5. Accepting one's self as a worthwhile person
6. Moving from the concrete to the abstract and applying general principles
7. Language and communication
8. Identifying with one's sex-mates

For each developmental task listed under the four stages of development, sample student behaviors were identified for the general school environment and for the industrial arts environment. This information was intended to provide the curriculum developer clues concerning how the specific developmental task might be achieved in both the general school and industrial arts environments. For the purpose of this presentation, samples contained in the Maryland Guide were reorganized in the following illustration.

STAGE OF DEVELOPMENT: EARLY ADOLESCENCE

DEVELOPMENTAL TASK: Establishing one's independence from adults.

GENERAL BEHAVIOR: The students . . .

- . . . make decisions regarding work to be done.
- . . . perform leadership roles among peers.
- . . . make selections from a limited number of alternatives.

INDUSTRIAL ARTS BEHAVIOR: The students . . .

- . . . select an area of study to be pursued in the industrial arts class.
- . . . play a leadership role in the personnel organization of a business of line production activity.
- . . . make independent decisions about processes and tools to be used in the construction of a project.

Although the sample behaviors listed in the Maryland Guide were not intended to be exhaustive or complete, they can serve as a point of departure for educators interested in incorporating concern for individual growth and development into the curriculum development process. The design, selection, and organization of instructional activities to allow students to experience successful attainment of the developmental tasks thus becomes the essential responsibility of the local industrial arts curriculum developer.

Local-Level Application

During the 1977-78 school year and summer, several local education agencies in Maryland conducted county-wide curriculum development workshops for industrial arts. The purpose of these workshops was to apply the foundation presented in the Maryland Industrial Arts State Guide to the local curriculum development process. The workshops were planned and conducted by local education agencies with assistance from the Department of Industrial Education and the Curriculum R&D Center of the University of Maryland. The strategy designed to help orient participating workshop teachers to the process of curriculum development based on both developmental tasks and content related to industry and technology consisted of the following series of steps.

The first step entailed the development of A Compilation of Developmental Tasks With Activities for Industrial Arts (Sarapin & Murphy, 1978). This publication used an alpha-numerical coding system organizing behavioral information to provide an easy-access catalog of developmental tasks, general school activities, and industrial arts activities derived from the Maryland Guide. This document was used to help orient workshop teachers to (1) student behaviors

associated with each stage of development, and (2) the process of curriculum development based on the developmental tasks of youth. An example of the information contained in this compilation of developmental tasks is presented in Figure 1.

The second step entailed identification of instructional programs intended to undergo curriculum revision and improvement. Local teacher committees developed brief descriptions of existing and proposed school programs to serve as content references in later curriculum development. These program descriptions were reviewed by the workshop participants and duplicated on the Program Activities Planning Sheets illustrated in Figure 2.

The third step of the process represented the crucial component in which developmental tasks and instructional content combined to form the foundation for curriculum development. This step was achieved by conducting brainstorming sessions in which workshop participants used the general school activities and industrial arts activities for each developmental task as clues for writing instructional activities related to the content associated with a specific program description. For example, one local system identified a description for a proposed middle school program entitled, "Construction and Living Environments." Teachers working in that workshop used the program description and sample behaviors for late childhood and early adolescence to generate possible activities for the proposed program. Many teachers found it helpful to place the Program Activities Planning Sheet alongside the appropriate page in the catalog of developmental tasks in the process of generating ideas. Participants worked individually and in small groups in the brainstorming activity to

DEVELOPMENTAL LEVEL: Early Adolescence		
DEVELOPMENTAL TASK	GENERAL ACTIVITY	INDUSTRIAL ARTS ACTIVITY
3.1 Decision-Making and Reasoning	The students..	
	3.1.a. make decisions about their role	in the class or laboratory
	3.1.b. develop standards	of performance and personal involvement
3.2 Controlling and Using a New Body	3.2.a. engage in manipulative activities	with hand-held tools
	3.2.b. engage in gross motor activities	regarding the unassisted movement of things and the body
	3.2.c. engage in placement activities	regarding categorizing and the movement of ob- jects

Figure 1. Sample behavioral information

Program Activities

PROGRAM NAME: MS CONSTRUCTION AND LIVING ENVIRONMENTS

Program Activities Related to Dev. Tasks

PROGRAM DESCRIPTION

Emphasis:

- 1) present and future construction technology
- 2) current and emerging careers in construction and urban development
- 3) development of leisure time interests
- 4) basic home maintenance practices

Instruction and Hands-On Experience:

- 1) tools
- 2) materials
- 3) processes

Topics:

- 1) home construction - general
- 2) structural design and erection
- 3) site planning and surveying
- 4) carpentry
- 5) masonry
- 6) electrical systems
- 7) plumbing
- 8) energy conservation

Figure 2. Program activities planning sheet

produce a "laundry list" of possible activities that attempted to integrate developmental task data and instructional content. In order not to impede the brainstorming process, no attempt was made to refine or organize the ideas generated at this point. Teachers were encouraged and reinforced to generate as many different activity ideas as possible for each developmental task of the stages of development associated with the particular program. An example of the output of this step in the curriculum development process is presented in Figure 3.

The fourth step of the process entailed the refinement of the program descriptions and activities previously identified. Refinement of the program descriptions was achieved by a traditional process of generating topical content outlines. Units of instruction were planned using Program Planning Sheets. At this point, a committee of workshop participants selected, refined, and organized the appropriate instructional activities generated from the brainstorming sessions. The selected activities and instructional content thus became finished products intended for classroom tryout. A sample Program Topic Planning Sheet is presented in Figure 4.

The fifth step in the curriculum development process entailed field testing of the content and instructional activities identified during the curriculum workshops. Participating teachers are currently using and evaluating the material developed. Additional workshops will be conducted to assess and revise the material developed.

Program Activities

PROGRAM NAME: MS CONSTRUCTION AND LIVING ENVIRONMENTS

Program Activities Related to Dev. Tasks

PROGRAM DESCRIPTION

- 2.1.a students volunteer for positions within a work group
- 2.1.a investigate career options related to their role in the work group
- 2.1.b students decide which living environment is most suitable to themselves
- 2.1.b selects the appropriate building materials and techniques for a simple frame structure
- 2.1.c establish job requirements for personnel in a construction activity
- 2.1.d establish and maintain an effective safety program related to construction activities
- 2.1.e determine which drawings are necessary for a house design
- 2.1.e form small work groups for completing construction activities
- 2.1.f determine acceptable line weights for drawings
- 2.1.g establish and maintain a quality control program related to construction
- 2.1.g students conduct seminar to determine the direction and scope of a class construction activity
- 2.1.h set tolerance limits for frame construction
- 2.1.i students apply the scientific method in solving a const. problem.

Emphasis:

- 1) present and future construction technology
- 2) current and emerging careers in construction and urban development
- 3) development of leisure time interests
- 4) basic home maintenance practices

Instruction and Hands-On Experience:

- 1) tools
- 2) materials
- 3) processes

Activities: *

- 1) structural design and erection
- 2) site planning and surveying
- 3) carpentry
- 4) masonry
- 5) electrical wiring
- 6) plumbing

* NOTE:

THESE "ACTIVITIES" APPEARED IN THE ORIGINAL CORE GUIDE. THEY WERE REVISED AND CHANGED TO "TOPICS" IN THIS GUIDE.

SAMPLE

Figure 3. Completed planning sheet

Program Topic

MS CONSTRUCTION AND
LIVING ENVIRONMENTS
MASONRY

CONTENT EMPHASIS		DEVELOPMENTAL TASK EMPHASIS	
TOOLS Basic Woodworking Tools Brick Trowels Finishing Trowels Plumb Bob Masonry Level Joint Tools Mortar Boards Screeds	MATERIALS Cement Sand Gravel Building Felt	RESOURCES <u>Exploring the Construc-</u> <u>tion Industry -</u> <u>McKnight</u> <u>Construction - Mats,</u> <u>Methods, Careers - G-W</u> <u>Construction:</u> <u>Techniques</u> Prentice- <u>Hall</u>	
CONTENT OUTLINE MASONRY I. Site Preparation A. Lay out the building B. Excavation II. Footings A. Types of footings B. Forms C. Mixing and pouring cement III. Foundation Walls A. Types of blocks B. Mixing mortar C. Laying block at corners D. building between corners E. Checking accuracy F. Tooling joints G. Special problems H. Termite shields and sills		ASSOCIATED DEVELOPMENTAL ACTIVITIES 1.6.b Students learn new technical vocabulary. 1.8.a Students learn the importance of safety in construction. Students seek reasons why things are done in a certain manner, i.e., why footings are placed below the frost line. 3.2 Students engage in manipulative activities with hand-held tools in masonry (use of trowel, striking tools, level, plumb bob, etc.). 3.1.b The students develop standards of performance and personal involvement in masonry.	

Figure 4. Program topic planning sheet

Conclusion

The curriculum development process described in this presentation represented an attempt to address a concern for placing the learner at the center of the instructional process. This was achieved in local curriculum development by utilizing information related to human growth and development. In this process teachers were able to use a foundation of developmental tasks of youngsters to develop and revise instructional programs centered upon the content of industry and technology. Although the instructional activities developed were organized according to a content base, the growth and development of students was the functional starting point in curriculum development.

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